UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/035,928	12/26/2001	Anthony Bessios	Bessios 3	2199

46900 7590 06/02/2005

MENDELSOHN & ASSOCIATES, P.C.
1500 JOHN F. KENNEDY BLVD., SUITE 405
PHILADELPHIA, PA 19102

EXAMINER	
LEUNG, CHRISTINA Y	
ART UNIT	**PAPER NUMBER**
2633	

DATE MAILED: 06/02/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/035,928	BESSIOS, ANTHONY	
	Examiner	Art Unit	
	Christina Y. Leung	2633	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *26 December 2001*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-25* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-3,5,7,10-15,17 and 22-25* is/are rejected.

7)☒ Claim(s) *4,6,8,9,16 and 18-21* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *26 December 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. Claim 7 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 7 recites the limitation "the cost function" in line 1 of the claim. There is insufficient antecedent basis for this limitation in the claim because claims 1 and 5 on which is depends do not previously recite a cost function. Examiner respectfully notes that claim 7 may depend on claim 6 instead.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1-3, 5, 13-15, and 17 are rejected under 35 U.S.C. 102(b) as being anticipated by Kayanuma (US 5,561,647 A).

Regarding claim 1, Kayanuma discloses an apparatus for applying compensation to samples received from an optical channel (Figure 1) comprising:

an equalizer 4 having an equalizer response spectrally shaping the samples for compensation to generate a sequence of equalized samples (column 3, lines 8-16);

an error generator 6 generating an error for a current sample based on the difference between 1) an equalized current sample and 2) a decision for the current sample adjusted for a

target response, wherein the target response is based on a response of the optical channel (column 3, lines 17-28); and

a combiner (coefficient control circuit 7) configured to combine the error with one or more samples to provide an update signal, wherein the equalizer 4 employs the update signal to adjust the equalizer response to the target response (column 4, lines 29-33).

Regarding claim 13, Kayanuma discloses a method of applying compensation to samples received from an optical channel comprising the steps of:

(a) spectrally shaping, with an equalizer 4, the samples for compensation to generate a sequence of equalized samples (column 3, lines 8-16);

(b) generating an error (using error calculation circuit 6) for a current sample based on the difference between 1) an equalized current sample and 2) a decision for the current sample adjusted for a target response, wherein the target response is based on a response of the optical channel (column 3, lines 17-28);

(c) combining the error with one or more samples to provide an update signal (using coefficient control circuit 7); and

(d) updating the equalizer with the update signal to adjust the equalizer response to the target response (column 4, lines 29-33).

Regarding claims 2, 3, 14, and 15, Kayanuma disclose a maximum likelihood sequence estimation (MLSE) detector 8, the MLSE detector generating decoded data from the sequence of equalized samples with an algorithm having transitions based on the target response (column 3, lines 34-48).

Regarding claims 5 and 17, Kayanuma disclose that the equalizer comprises a filter defined by a set of filter taps (column 3, lines 11-13).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 11, 23, and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kayanuma.

Regarding claims 11 and 23, Kayanuma disclose a system and method for applying compensation to samples received from an optical channel as discussed above with regard to claims 1 and 13, but Kayanuma do not specifically disclose an integrated circuit. However, it is well understood in the art that electronic circuits with electronic elements such as disclosed by Kayanuma may be implemented as integrated circuits. Regarding claims 11 and 23, it would have been obvious to a person of ordinary skill in the art to implement the circuitry disclosed by Kayanuma as an integrated circuit in order to manufacture the circuit compactly and efficiently.

Regarding claim 25, Kayanuma discloses a method for applying compensation to samples received from an optical channel including steps of:

(a) spectrally shaping, with an equalizer 4, the samples for compensation to generate a sequence of equalized samples (column 3, lines 8-16);

(b) generating an error (using error calculation circuit 6) for a current sample based on the difference between 1) an equalized current sample and 2) a decision for the current sample

adjusted for a target response, wherein the target response is based on a response of the optical channel (column 3, lines 17-28);

(c) combining the error with one or more samples to provide an update signal (using coefficient control circuit 7); and

(d) updating the equalizer with the update signal to adjust the equalizer response to the target response (column 4, lines 29-33).

Kayanuma does not specifically disclose a computer-readable medium executed by a processor to implement this method, but computers are well known in the art, and it is further well understood in the art that electronic circuits such as disclosed by Kayanuma may be controlled with computers/processors. It would have been obvious to a person of ordinary skill in the art to use a processor and computer-readable medium to execute the method already disclosed by Kayanuma in order to automatically process and compensate the incoming signals.

6. Claims 10, 12, 22, and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kayanuma in view of Bulow (US 6,016,379 A).

Regarding claims 10, 12, 22, and 24, Kayanuma disclose a system and method for applying compensation to samples received from an optical channel as discussed above with regard to claims 1 and 13, but Kayanuma do not specifically disclose that the system or method is implemented in a receiver of an optical communication terminal or that the equalization accounts for differential group delay of a signal passing through a single mode fiber. However, Bulow teaches that signals passing through a single mode fiber may experience distortions from differential group delay (column 1, lines 22-37). Bulow further teaches using an equalizer in the receiving end to compensate for this distortion (column 1, lines 49-56). It would have been

obvious to a person of ordinary skill in the art to use the compensation system and method disclosed by Kayanuma in the receiving end of an optical communication system such as taught by Bulow in order to use the system to correct errors in signals that had been transmitted over fiber.

Allowable Subject Matter

7. Claims 4, 6, 8, 9, 16, and 18-21 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

8. Claim 7 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

9. The following is a statement of reasons for the indication of allowable subject matter:

The prior art, including Kayanuma and Bulow, does not specifically disclose or fairly suggest a system and method for applying compensation to samples from an optical channel including all the elements, steps, and limitations recited in claims 4, 6-9, 16, and 18-21 (and including all the limitations of the claims on which they depend), particularly wherein the set of filter taps are adapted in accordance with a recursive update rule, wherein the update rule is generated from a cost function; or wherein the target response is of the form A+D, where A is a parameter ranging from about 0 to about 1, and D is a unit delay; or including an accumulator configured to accumulate the square of each error value, wherein the accumulation of the squared error values relates to a parameter of the target response, and the algorithm adjusts its

transitions by adaptation of the parameter of the target response or the apparatus adapts the parameter of the target response during initialization of the apparatus.

Conclusion

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christina Y. Leung whose telephone number is 571-272-3023. The examiner can normally be reached on Monday to Friday, 6:30 to 3:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan can be reached on 571-272-3022. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 571-272-2600.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Christina Y Leung
Christina Y Leung
Patent Examiner
Art Unit 2633